

CLAIMS

We claim:

1 1. A method for modifying at least one electrical characteristic of a horn antenna,
 2 comprising the steps of:
 3 configuring said horn antenna in a first operating mode in which said horn
 4 antenna has at least a first electrical characteristic; and
 5 selectively changing at least one of a volume and a location of a conductive fluid
 6 contained within said horn antenna to produce at least a second operating mode in
 7 which said horn antenna has at least a second electrical characteristic different from said
 8 first electrical characteristic.

1 2. The method according to claim 1 wherein said selectively changing step further
 2 comprises selectively varying a profile of at least one conductive inner surface of said
 3 horn antenna.

1 3. The method according to claim 1 wherein said selectively changing step further
 2 comprises selectively varying a position of at least one conductive surface of said horn
 3 antenna.

1 4. The method according to claim 1 wherein said selectively changing step further
 2 comprises changing a flare angle of said horn antenna.

1 5. The method according to claim 1 wherein said selectively changing step further
2 comprises changing at least one internal dimension of a throat region of said horn
3 antenna.

1 6. The method according to claim 1 wherein said selectively changing step further
2 comprises changing at least a corrugation geometry of said horn antenna.

1 7. The method according to claim 1 wherein said selectively changing step further
2 comprises changing at least an aperture diameter of said horn antenna.

1 8. The method according to claim 1 wherein said electrical characteristic is selected
2 from the group consisting of an input impedance, a radiation pattern, a gain, and an
3 antenna beamwidth.

1 9. The method according to claim 1 wherein said selectively changing step further
2 comprises controlling at least one of a valve, a pump and a fluid actuator.

1 10. An electromagnetic horn antenna comprising:
2 a horn housing having a throat portion, a tapered portion and an aperture;
3 at least one cavity structure defined within said horn housing, said cavity
4 structure comprising at least one portion formed of a dielectric material; '
5 a conductive fluid and a fluid control system, said fluid control system selectively
6 controlling at least one of a volume and a position of said conductive fluid contained

7 within said at least one cavity structure for dynamically modifying at least one electrical
8 characteristic of said electromagnetic horn antenna.

1 11. The electromagnetic horn antenna according to claim 10 wherein an interior
2 surface of said housing is corrugated so as to define a series of ribs axially spaced along
3 a length of said horn housing and defining a plurality of slots.

1 12. The electromagnetic horn antenna according to claim 10 wherein said at least
2 one cavity structure is at least partially comprised of said ribs.

1 13. The electromagnetic horn antenna according to claim 12 wherein at least one of
2 said plurality of ribs is formed of a conductive material.

1 14. The electromagnetic horn antenna according to claim 12 wherein at least one of
2 said plurality of ribs is formed of a dielectric material.

1 15. The electromagnetic horn antenna according to claim 10 wherein said at least
2 one portion of said cavity structure is an annular dielectric wall extending between
3 adjacent ones of said ribs.

1 16. The electromagnetic horn antenna according to claim 10 wherein said at least one
2 electrical characteristic is selected from the group consisting of an input impedance, a
3 radiation pattern, a gain, and an antenna beamwidth.

1 17. The electromagnetic horn antenna according to claim 10 wherein said control
2 system controls said volume of said conductive fluid to change a flare angle of said horn
3 antenna.

1 18. The electromagnetic horn antenna according to claim 10 wherein said control
2 system controls said conductive fluid to change at least one internal dimension of said
3 horn antenna.

1 19. The electromagnetic horn antenna according to claim 10 wherein said control
2 system controls said conductive fluid to change at least a corrugation geometry of said
3 horn antenna.

1 20. The electromagnetic horn antenna according to claim 10 wherein said control
2 system controls said conductive fluid to change at least an aperture diameter of said
3 horn antenna.

1 21. The electromagnetic horn antenna according to claim 10 wherein said control
2 system controls said conductive fluid to convert an inner conductive surface of said horn
3 antenna from a smooth profile to a corrugated profile.